
**Ships and marine technology —
Launching appliances for free-fall
lifeboats**

*Navires et technologie maritime — Engins de mise à l'eau des
embarcations de sauvetage par chute libre*

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Contents

Page

Foreword.....	iv
Introduction	v
1 Scope	1
2 Normative reference	1
3 Terms and definitions	2
4 Performance	2
4.1 Free-fall launching of lifeboat (hereinafter simply referred to as free-fall launching).....	2
4.2 Recovery of lifeboat	3
4.3 Controlled launching of lifeboat.....	3
4.4 Stowage of lifeboat.....	3
4.5 Float-free launching of lifeboat	3
5 Design and construction.....	3
5.1 General requirements.....	3
5.2 Construction.....	4
5.3 Launching ramp.....	4
5.4 Arm.....	4
5.5 Winch	5
5.6 Loose gears.....	5
5.7 Lashing gears.....	6
5.8 Embarkation platform.....	6
5.9 Operation	6
6 Test method.....	6
6.1 Test of winch	6
6.2 Test of loose gears	6
6.3 Test of launching appliance	6
7 Acceptance code	9
7.1 Prototype test.....	9
7.2 Production test.....	10
8 Inspection and maintenance	10
9 Marking	11
Bibliography	12

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 22673 was prepared by Technical Committee ISO/TC 8, *Ships and marine technology*, Subcommittee SC 4, *Outfitting and deck machinery*.

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Introduction

This International Standard forms a code of practical interpretation and amplification of the requirements of the convention for the Safety of Life at Sea (SOLAS), to provide an identical basis for design, manufacture and acceptance of launching appliances for free-fall lifeboats for use by ship-owners, shipbuilders and appropriate organizations.

This International Standard provides the design requirements for launching ramp length and angle. According to 6.1.4.7 of the LSA Code, the secondary launching appliance can use both the ship's main and emergency power supplies, so it is significant to admit the conviction that boat handling appliances can be independent of launching ramps. A simulated launching test and strip for inspection are supplemented in the test method. This International Standard includes requirements of lifeboat stowage, arrangement on board, inspection and maintenance because the launching appliances for free-fall lifeboats are closely related to ships.

This International Standard is mainly based on amendments to SOLAS 1974, dating from 1983 to 1996, and relevant IMO resolutions and protocols, especially Res.MSC.47(66)^[1], Res.MSC.48(66)^[2], Res.MSC.81(70)^[3], Res.MSC.216(82)^[4] and Res.MSC.218(82)^[5]. This International Standard also refers to MSC/Circ.980^[6], MSC/Circ.1205 and MSC/Circ.1206.

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Ships and marine technology — Launching appliances for free-fall lifeboats

1 Scope

This International Standard defines certain terms for launching appliances for free-fall lifeboats (hereinafter simply referred to as free-fall launching appliances) and specifies the requirements for design, construction, acceptance, examination, performance, operation and maintenance.

This International Standard is applicable to the launching appliances which use inclined ramps to launch free-fall lifeboats (hereinafter simply referred to as lifeboats) from ships and from offshore platforms.

2 Normative reference

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 2944, *Fluid power systems and components — Nominal pressures*

ISO 3828, *Shipbuilding and marine structures — Deck machinery — Vocabulary and symbols*

ISO 4413, *Hydraulic fluid power — General rules relating to systems*

ISO 4414, *Pneumatic fluid power — General rules relating to systems*

ISO 15516 *Ships and marine technology — Launching appliances for davit-launched lifeboats*

IEC 60092 (all parts), *Electrical installations in ships*

IEC 60529:2001, *Degrees of protection provided by enclosures (IP Code)*

IMO LSA Code, *International Convention for the Safety of Life at Sea (SOLAS) 1974*

Marpol 73/78, *International Convention for the Prevention of Pollution From Ships, 1973*

MSC.1/Circ.1205, *Measures to prevent accidents with life-boats*

MSC.1/Circ.1206, *Guidelines for developing operation and maintenance manuals for life-boat systems*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 3828, ISO 15516, IMO LSA Code and the following apply.

3.1 maximum working load
load applied to the ramp or loose gear of a free-fall launching appliance when it launches the boat of the maximum all-up weight for which it is designed

3.2 maximum recovering load
load applied to the loose gear of a free-fall launching appliance in order to recover the non-loaded boat with the operating crew of the maximum all-up weight for which it is designed

NOTE The minimum operating crew compliment is three persons, their average mass being 75 kg.

3.3 lightest launching load
load applied to the ramp or loose gear of a free-fall launching appliance when it launches the non-loaded boat of the minimum all-up weight for which it is designed

3.4 maximum working load of winch
load applied to the exit end of the falls on the outmost layer at the winch drum of a free-fall launching appliance under any working condition

3.5 hoisting load of winch
load applied to the exit end of the falls on the outmost layer at the winch drum of a free-fall launching appliance when it hoists the maximum recovering load by means of its arms and falls

3.6 launching load of winch
load applied to the exit end of the falls on the outmost layer at the winch drum of a free-fall launching appliance when it launches the maximum working load by means of its arms and falls

3.7 lightest launching load of winch
load applied to the exit end of the falls on the outmost layer at the winch drum of a free-fall launching appliance when it launches the lightest launching load by means of its arms and falls

4 Performance

4.1 Free-fall launching of lifeboat (hereinafter simply referred to as free-fall launching)

4.1.1 A free-fall launching appliance shall, by means of launching ramps, be capable of safe free-fall launching the fully-loaded boat (equivalent to maximum working load) and/or the non-loaded boat (equivalent to lightest launching load) from the stowed position, against a trim of up to 10° and a list of up to 20° either way, independent of any means other than gravity or stored mechanical power which, in turn, is independent of the ship's power supply. It shall also be capable of enabling the lifeboat to be effectively clear of the ship after entry into the water.

4.1.2 Notwithstanding the requirement of 4.1.1, a free-fall launching appliance for oil tankers, chemical tankers and gas carriers with a final angle of heel greater than 20° calculated in accordance with MARPOL 73/78, shall be capable of free-fall launching of the fully-loaded boat or the non-loaded boat at the final angle of heel on the lower side of the ship taking into consideration the final damaged waterline of the ship. It shall also be capable of enabling the lifeboat to be effectively clear of the ship after entry into the water.

4.1.3 A free-fall launching appliance shall be capable of simulating launching of the lifeboat stationed on the ramp, without allowing the lifeboat to fall into the water.

4.2 Recovery of lifeboat

A free-fall launching appliance shall be capable of recovering a non-loaded lifeboat with crew (equivalent maximum recovering load) by power, from the water to its stowed position under ship conditions of approximately even keel.

4.3 Controlled launching of lifeboat

Each free-fall launching appliance shall be provided with a secondary means of launching the fully-loaded boat and the non-loaded boat by means of arms and falls under control, against a trim of up to 2° and a list of up to 5° either way, from its stowed position, into the water. Such means can use the ship's main and emergency power supplies.

4.4 Stowage of lifeboat

4.4.1 A free-fall launching appliance shall be so designed and arranged that the distance from the lowest point on the lifeboat it serves, to the still water's surface does not exceed the lifeboat's free-fall certification height.

4.4.2 The lifeboat shall not only be held securely in its stowed position, but also be constantly in a ready-to-launch state so that two crew members can complete the preparation for embarkation and launching the lifeboat within 5 min.

4.5 Float-free launching of lifeboat

Where a free-fall launching appliance is designed to float free, the float-free release of the lifeboat from its stowed position shall be automatic.

5 Design and construction

5.1 General requirements

5.1.1 A free-fall launching appliance shall be constructed from materials that are not damaged in the air temperature range -30 °C to $+65\text{ °C}$.

5.1.2 Materials of a free-fall launching appliance which are exposed to the weather shall be resistant to deterioration and corrosion, or protected by galvanizing and other safeguarding means.

5.1.3 Equipment that is likely to be immersed in seawater such as hydrostatic release units and weak links shall operate in the seawater temperature range -1 °C to -30 °C .

5.1.4 The major structural members, such as ramps, arms, sheave racks, etc., shall be made from materials in the form of steel plates, tubes or profiled bar that meet the requirements for seagoing conditions and have the satisfactory weldability. Their minimum thickness shall be not less than 6 mm. The major structural members shall be designed with a factor of safety of not less than 4,5 on the basis of the maximum working load assigned and the ultimate strengths of the materials used for construction.

5.1.5 Loose gears, such as lifting beams, blocks, chains, links, shackles, hooks, padeyes, etc., shall not be made from cast and/or similar fragile materials. Loose gears shall be designed with a factor of safety of not less than 6 on the basis of the maximum working load assigned and the ultimate strengths of the materials used in connection with launching equipment.

5.1.6 Each free-fall launching appliance shall remain effective for life-saving under conditions of icing.

5.1.7 Each free-fall launching appliance shall be so constructed that only a minimum amount of routine maintenance is necessary. All parts requiring regular maintenance by the ship's crew shall be readily accessible and easily maintained.

5.2 Construction

For the purpose of meeting the performance requirements as specified in 4.1 to 4.4, each free-fall launching appliance shall have four functions: viz, free-fall launching, recovering, controlled launching, lifeboat stowage. Therefore, the construction of a free-fall launching appliance shall consist of two major portions: the launching ramp and the boat recovery/launching appliance. The two portions are usually designed to be integrated into one unit, but sometimes can be designed to be constructed separately with independent performance. Notwithstanding the design, the four functions as mentioned above shall be provided with, and all relevant performances shall be in compliance with, the accorded requirements of this International Standard.

5.3 Launching ramp

5.3.1 The launching ramp shall be designed and arranged according to the parameters provided by the manufacturer of the lifeboat and certified by the approving authority in order to protect the occupants in the lifeboat from harmful acceleration forces resulting from free-fall launching, and to ensure the lifeboat's effective clearing of the ship after entry into the water.

With the ship on an even keel, the angle between the horizontal and the launch rail of the lifeboat in its launching position shall be equal to the certified launching ramp angle. This angle shall not be less than 30°.

With the ship on an even keel, the distance from the stern of the lifeboat in its launching position to the lower end on the ramp shall comply with the requirements of the certified launching ramp length.

5.3.2 The launching ramp shall be so designed and arranged that only one release hook is used to link the lifeboat to the launching ramp. The ramp shall also be provided with means to carry out simulated launching of the lifeboat.

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5.3.3 A free-fall launching appliance shall be constructed so as to prevent sparking and/or incendiary friction during the launching of the lifeboat. Means such as rollers or sliding boards can be used on the launching ramp.

5.3.4 Against unfavourable conditions of trim of up to 10° and a list of up to 20° either way, a launching ramp shall have sufficient strength and rigidity to withstand and safely launch a lifeboat with the weight equivalent to 1,1 times its maximum working load, as well as to withstand a static test with the proof load equivalent to 2,2 times the maximum working load.

5.3.5 Where a launching ramp is designed to be adjustable, it shall be adjusted satisfactorily with the lifeboat it serves loaded to 1,2 times the maximum fully-loaded boat.

5.4 Arm

5.4.1 Against a trim of up to 2° and a list of up to 5° either way, an arm shall have sufficient strength and rigidity to safely launch a lifeboat with the weight equivalent to 1,1 times its maximum working load, as well as to withstand a static test with the proof load equivalent to 2,2 times the maximum working load at full outboard position.

5.4.2 An arm shall be so arranged that sufficient extension will be provided to protect the lifeboat from impact when it is used to recover a lifeboat at the full outboard position.

5.4.3 A free-fall launching appliance using falls and arms shall be so constructed that the arm can be moved from the inboard position to the outboard and the hook can be lowered favorably under the condition of no load.

5.4.4 Where arms are recovered by power, limiting devices shall be fitted which will automatically cut off the power before the arms reach the stops in order to prevent overstressing the arms or falls, unless the winch system is designed to prevent such overstressing or shocks.

5.5 Winch

5.5.1 The winch brake of a free-fall launching appliance shall be capable of stopping the descent of any lifeboat intended at any time and holding it securely during the controlled launching of lifeboat. The winch brake shall be of sufficient strength to withstand a dynamic test with a proof load of not less than 1,1 times the maximum working load of the winch, as well as a static test with a proof load of not less than 1,5 times the maximum working load of the winch.

The winch brake used in lowering lifeboats by gravity shall be so designed as to be always applied unless the operator holds the brake control in the "off" position. The brake pads shall, where necessary, be protected from water and oil.

5.5.2 The winch drum shall be so designed and arranged that its nominal diameter shall be not less than 16 times the diameter of the falls. The number of layers of falls winding around the drum shall not exceed 3 unless a spooling device is fitted. The flange height of the drum shall always exceed the outmost fall layer by 1,5 times the diameter of the fall when the fall is fully and evenly wound around the drum.

In the case of a multiple drum winch, unless an efficient compensatory device is fitted, the falls shall be so arranged as to wind off the drums at the same rate when lowering, and to wind on to the drums evenly at the same rate when hoisting.

5.5.3 The transmission of winches shall be arranged with a closed enclosure so that only minimum daily maintenance is required. The gears and bearings of the transmission shall be well lubricated whenever the winch is left of 20°.

5.5.4 The winch power can be electrical, hydraulic or pneumatic.

Electrical drives and control equipment shall conform to the requirements of the IEC 60092 series of standards. Deck mounted enclosures and motors shall conform to IP56 of IEC 60529:2001.

Hydraulic drives and control equipment shall conform to the requirements of ISO 4413. System nominal pressures shall be selected from ISO 2944, and the drive shall operate satisfactorily at a pressure 10 % below the selected nominal pressure.

Pneumatic drives and control equipment shall conform to the requirements of ISO 4414. System nominal pressures shall be selected from ISO 2944, and the drive shall operate satisfactorily at a pressure 10 % below the selected nominal pressures.

5.6 Loose gears

5.6.1 Lifting beams, chains, shackles and other loose gears can be used to connect falls to lifeboats when a free-fall launching appliance recovers or lowers lifeboats by means of the falls.

5.6.2 Falls shall be of rotation resistant and corrosion resistant steel wire rope. Falls shall be long enough to have at least 3 dead turns of rope remaining on the winch's drum after the lifeboat is lowered from the stowed position into water with the ship in its lightest seagoing condition against an unfavorable trim of 2° and a list of 5°.

5.6.3 The sheave diameter at the bottom of the sheave groove shall be at least 12 times the diameter of the falls, and the depth of the sheave groove shall be at least 1,5 times the diameter of the falls. Means such as a sheave cover with a smaller clearance between the cover and the sheave shall be provided to keep the falls within the sheave at all times.